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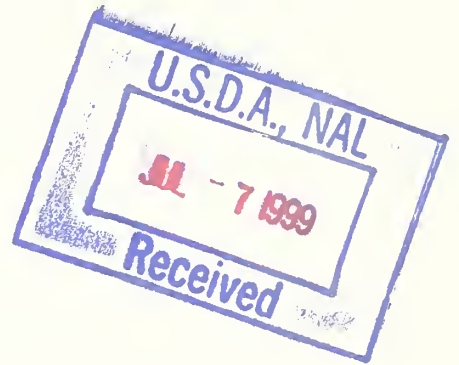
# BLANCHARD SPRINGS CAVERNS

progress report 1973  
OZARK National Forest

**United States  
Department of  
Agriculture**



**National Agricultural Library**



PROGRESS REPORT  
AND  
SUPPLEMENTAL DATA TO THE  
PRELIMINARY DEVELOPMENT PLAN  
FOR  
BLANCHARD SPRINGS CAVERNS  
OZARK-ST. FRANCIS NATIONAL FORESTS, ARKANSAS

—Revised September 1972—

FOREST SERVICE

U. S. DEPARTMENT OF AGRICULTURE

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# *Letter from the Supervisor*

We've been publishing yearly progress reports on the Blanchard Springs Caverns Project of Ozark National Forest since 1967 to keep you informed and up to date on our progress and plans to open these awesome caverns in Arkansas to the public.

To many, this year's report might give the impression that, since we are nearing completion of Phase 1 and are almost ready to open the first tour, we are about to "make an end."

We only wish that were true.

As you will read in the following pages, there's more development to come after opening ceremonies and dedication in 1973. If Blanchard Springs Caverns are to realize their potential as a first-rate National recreation area, offering a unique, quality recreation experience, then the years following 1973 will be as important to the planning and development effort as these nine years since 1963, when the project was conceived.

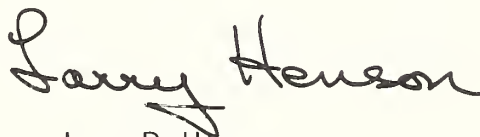
Our preliminary plan of development, approved in 1967, is being rewritten and updated to incorporate changes that have had to be made. For example, the 1967 plan calls for a motel on the complex. In 1972

hydrology studies confirmed the proposed motel site as the watershed of the underground stream in the caverns. Commercial development could have an effect on the quality of water entering the stream, and polluted water could upset the process of cave formation, in addition to endangering animal and plant life.

The revised plan will guide the future development on the 129,000-acre composite, hopefully seeing to completion the remaining phases of work on the project.

Watching Blanchard Springs Caverns become a reality has made us on the Ozark realize that they open in July 1973 only because of the cooperation, support and constructive criticism that have come from the State of Arkansas, federal agencies, and, of course, Forest Service personnel of the Southern Region in Atlanta, the national office in Washington, D. C., and other forests in the National Forest system.

It is anticipating this continued cooperation and help that we approach the remaining phases with renewed optimism that they will be accomplished. Right now, in Fiscal Year 1973, we've only just begun.



Larry D. Henson  
Forest Supervisor  
Ozark-St. Francis National Forests

# *the project:*

## **BLANCHARD SPRINGS CAVERNS**

Trying to describe Blanchard Springs Caverns is like trying to define the Grand Canyon, Niagara Falls, Yellowstone, the Mississippi River and any other natural wonder. Blanchard Springs Caverns are a network of caves, just as Grand Canyon is a deep gorge, Niagara is a waterfall, Yellowstone is a bunch of geysers and boiling springs, and the Mississippi is a long river. These descriptions leave a lot unsaid, but then these phenomena of nature seem to defy any appropriate, worthy descriptive terms.

In 1964 a national magazine focused attention on Blanchard Springs Caverns, capturing pictorially some of the splendid hidden formations and calling discovery of the caverns "one of the most extraordinary cave finds of the century."

This find came in a geographic region noted for its numerous limestone caves: the Ozark Mountains in northcentral Arkansas. Blanchard Springs Caverns lie some 200 feet beneath an Ozark National Forest recreation area on the Sylamore Ranger District. Nearby is Mountain View, Arkansas, a community considered by many folk scholars the cradle of Anglo-Saxon folk culture in America.



*Even on tiptoes, this young cave visitor can't top the stalagmite that captures his interest.*

*Blanchard Springs*



*The Ozark Mountains*





These mountain people, their Rackensack and folk music, have received as much or more national attention as the underground Ozark world being developed by the U. S. Forest Service 15 miles to the northwest.

When the first tour inside Blanchard Springs Caverns opens to the public in July 1973 under U. S. Forest Service management, the multiple use concept of outdoor recreation on the Ozark National Forest will take on a new and exciting depth. And a milestone in Forest Service history will be recorded as this Region 8 forest gains the distinction of being the only national forest with such a subterranean attraction developed for enjoyment by hundreds of thousands of visitors each year.

The Ozark Mountains in northcentral Arkansas have long been a highland retreat for those who savor the outdoor experience amid mile after mile of rivers and creeks, scenic lookouts in the form of sky-reaching mountain bluffs, forests full of wildlife, and pastoral scenes that capture a lifestyle fast disappearing in this 20th century.

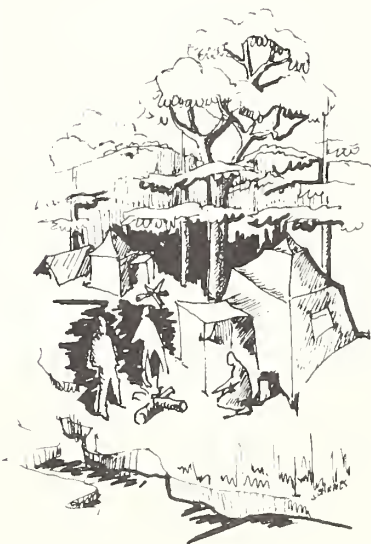
Since the 1930s and 40s, Blanchard Springs has become one of the most popular recreation areas on the forest. But the facilities built back during Civilian Conservation Corps days were found, in the 1960s, to be lacking as more and more visitors invaded the area on vacations, trips and outings. After discovery and exploration of the Ozarks' hidden dimension—Blanchard Springs Caverns—the Forest Service launched a phased development program for the Blanchard Springs Recreation Composite, consisting of the entire 129,000-acre district, and Blanchard Springs Caverns Complex, covering some 6,000 acres. The complex is within a one-day drive of 24.5 million persons.

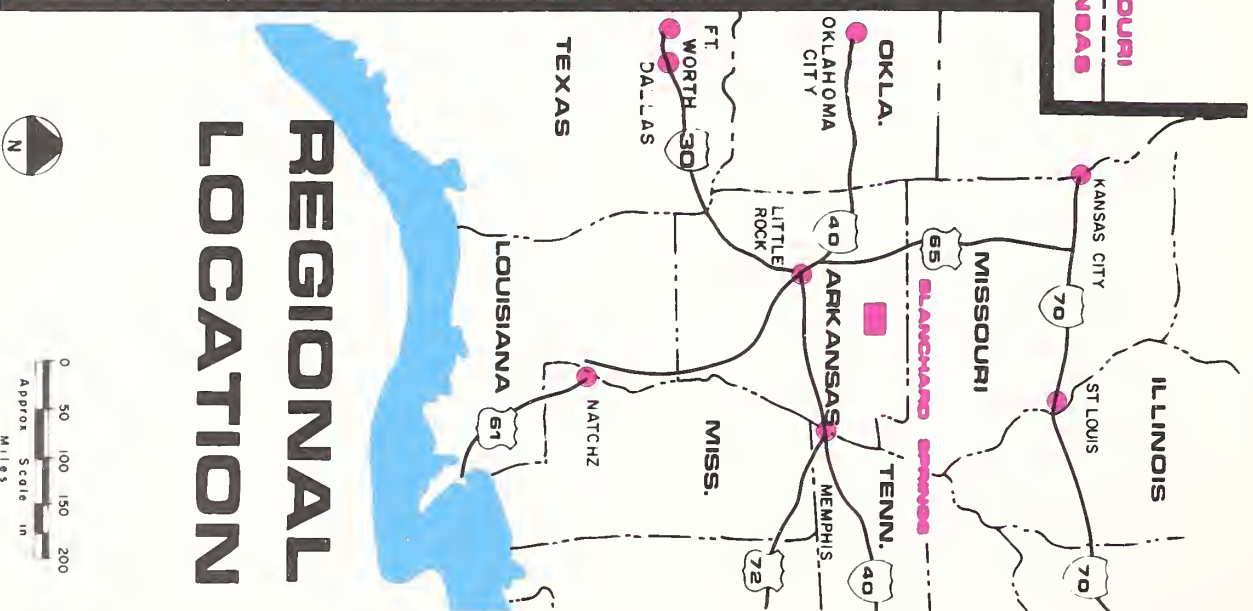
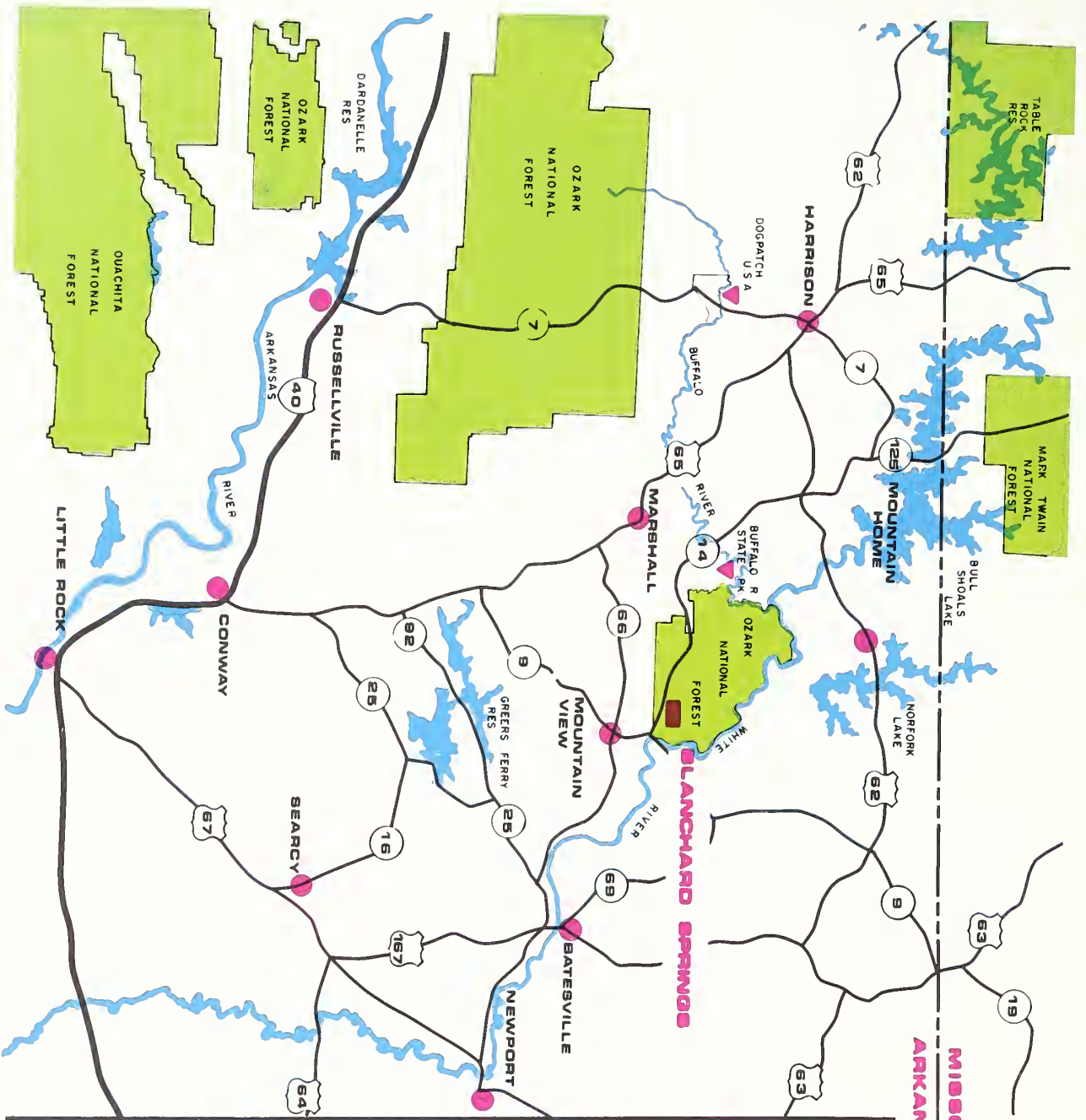
The first phase of this planned development provides for facilities essential to accommodate caverns visitors after opening. Other phases concentrate on development of two other caverns tours, scenic roads and quality recreation facilities on the White River and Buffalo National River on either side of the complex.

If all goes according to this phased plan, and if funding becomes available to finance the development, the Caverns Complex (and Composite) will someday feature three tours into the caverns, a swimming capacity of 950 persons at one time along the Sylamore Creek, 820 camping units, 386 picnic units, hiking and bridle trails, interpretive trails, a snack bar and gift shop.

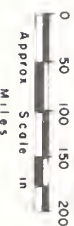
Much of the day use facilities being constructed during Phase 1—such as the amphitheater, bathhouse and orientation shelter—are

## FIRST TOUR OPENS IN JULY OF 1973





# REGIONAL LOCATION



in the Shelter Cave Recreation Area, which will offer a wide variety of recreation activities.

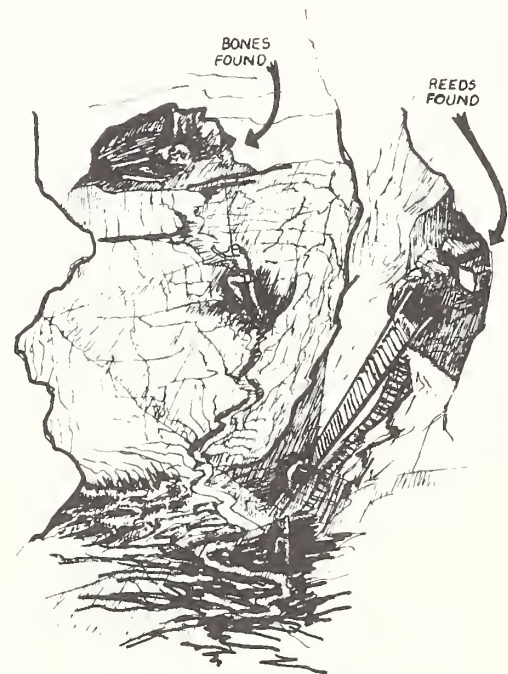
Located in the heart of this scenic national forest district, Blanchard promises to be a means by which the Forest Service will be able to acquaint visitors to the caverns and composite with broader aspects of national forest management, including the principle of multiple use management of the nation's forest resources for sustained yields of wood, water, forage, wildlife and recreation. A product of the caverns development appears to be a long-needed economic boost to Mountain View and Stone County, their spending, employment and personal income. It is a geographic area that could stand a shot in the arm as a decline is noted in some agriculture and lumber and wood products industries. Stone County, like other hill counties, has been handicapped in attracting manufacturing activity because of its inaccessibility. The county has no railroads or federal highways. Because of the county's recreation resources, its special events, Blanchard Springs Caverns and other attractions, the leisure-time industry and service-oriented industry are looked to as having the strongest potential.

The first caverns tour, called the Dripstone Trail, will take cave visitors over 7/10 of a mile in the uppermost level of the cavern system. In the course of about 90 minutes, cavegoers will follow a winding trail through the Cathedral Room, with its giant column, popcorn crystals, flowstones, flowing drapes and opera box arrangement of stalactites and stalagmites. Into the Coral Room, with its coral pond of lacy calcite rimstone terraces in still, shallow water. And beside a soda straw alcove with a maze of overhead hollow stalactites. After the caverns open, work will continue on two other tours below the Dripstone Trail.

One tour will emphasize the life that has entered the cave to adapt and dwell in the utter darkness of this watery underground environment. The tour will pass near the Stick Room, where the remains of a man were found in the cave. Here, in 1955 spelunkers discovered the bones of this early man. Visitors also will see the passageway where spelunkers came upon the cane reeds this early man apparently used for light. Through carbon dating, scientists estimate that this material is almost 1,100 years old. Unusual formations in the Ghost Room, the Helectite Room and the Titan Room await visitors on the planned third tour to the fascinating west end of the lower level.

The caverns visitor will begin his cave experience aboveground in a Visitor Information Center that has facilities for interpreting the geology and life of the cave via orientation displays, exhibits on "Life in the Dark," an audio visual program and publications.

### BLANCHARD WILL DEMONSTRATE MULTIPLE USE





In all its planning and development of Blanchard Springs Caverns, the Forest Service has been guided by the central purpose of providing a quality recreation experience for the forest visitor, while conserving the forest and cave environment.

It was in accord with this purpose that the Forest Service closed the natural entrance to what was then called Half-Mile Cave in 1963. Spelunking activity in the caverns between 1955 and 1963 had seen the destruction of cave formations and the removal or obliteration of materials essential in interpreting the human and geologic history.

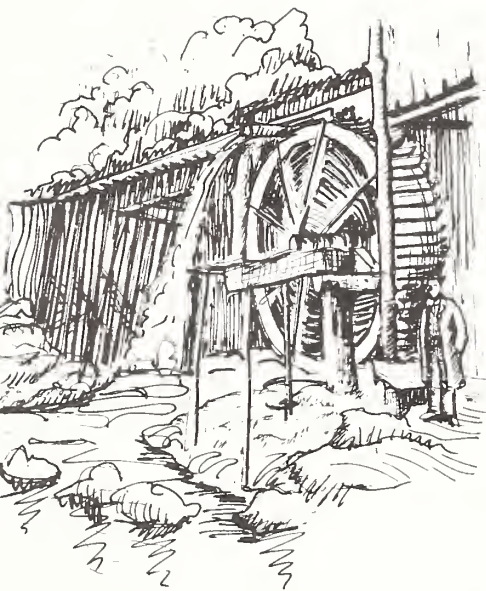
On July 1, 1963, Acting Regional Forester L. S. Newcomb issued a proclamation classifying Half-Mile Cave as a unique natural area "hereby set apart and reserved for public recreation use and closed to all other occupancy and use except such uses as the Regional Forester may authorize as being consistent with recreation use."

Discovery, exploration and development of Blanchard Springs Caverns for public enjoyment have taken a relatively short time considering that the caverns were millions of years in the making. Some parts of the caverns are found in Ordovician rock deposited up to 450 million years ago.

Very little of the history of the caverns' early exploration can be ascertained, but Forest Service research has determined that the 70-foot vertical natural entrance has been known since the late 1800s, or shortly after the settlement of the area by white men. There might have been other natural entrances, long since sealed by mud-slides or other natural happenings, if one is to believe some tales that have never been substantiated or documented.

In the 1930s the cave got the name Half-Mile Cave since it was located 1/2 mile up and around the mountain from Blanchard Springs, where the underground stream empties from the side of the mountain at the rate of from 500 to 2,500 gallons a minute. A Civil War veteran, John H. Blanchard, formerly of Kentucky, operated an undershot grist mill near the springs and used the water for power to run the mill. Curious local residents of the area threw cornstalks into the natural opening and saw them emerge from the springs almost 24 hours later.

It was also in the 1930s, the fall of 1934, that Willard Hadley, a Forest Service recreation planner, entered the caverns with the help of some Civilian Conservation Corps workers in the area. He and the CCC men hoisted a rowboat over the springs and rowed a few hundred feet upstream, until the water was only a few inches below the



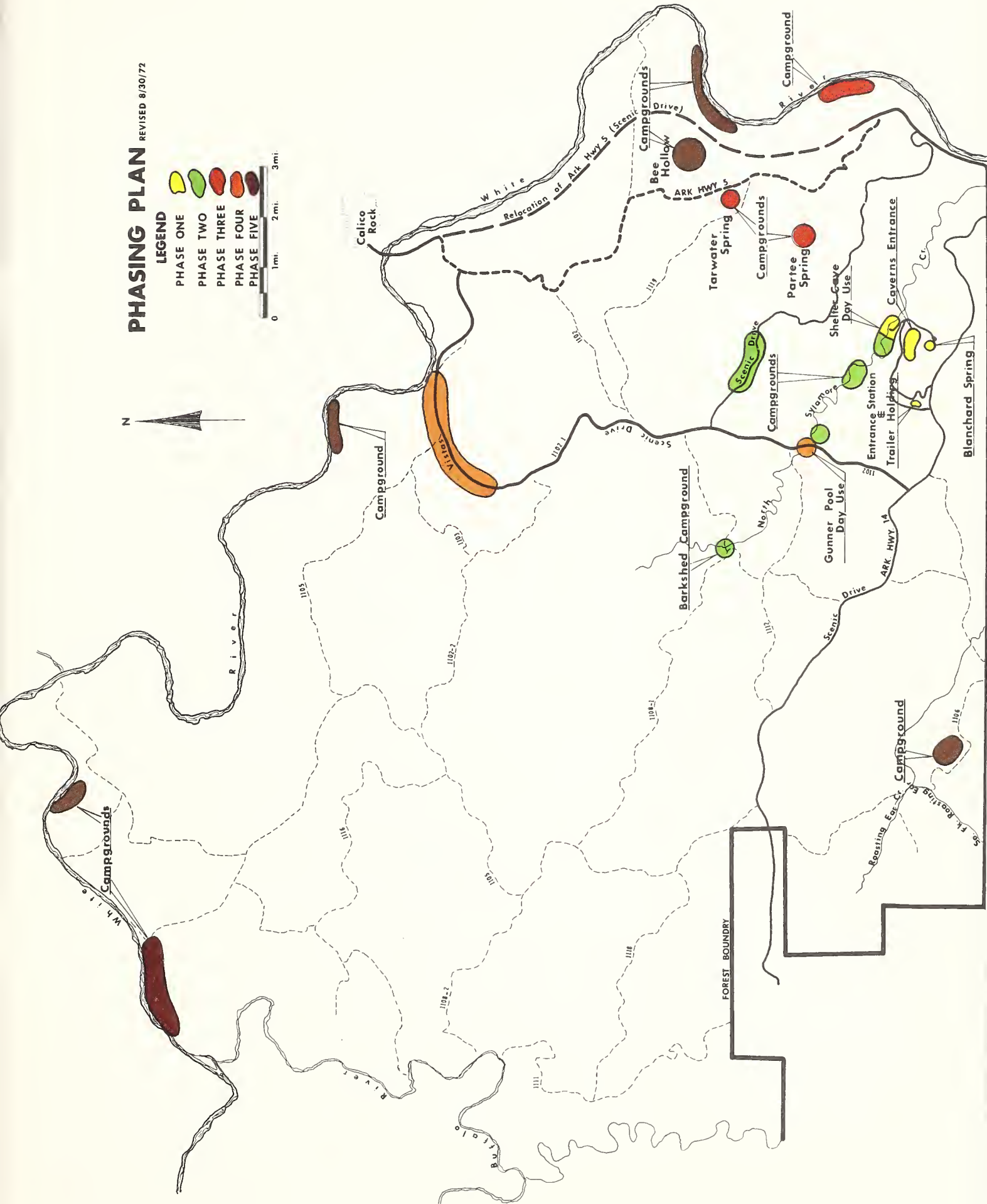


# PHASING PLAN

REVISED 8/30/72

## LEGEND

- PHASE ONE
- PHASE TWO
- PHASE THREE
- PHASE FOUR
- PHASE FIVE





cave ceiling. A week later, secure in a body harness, the CCC men lowered Hadley into the darkness of Half-Mile Cave. But he feared the cave roof was unstable and stayed only about an hour, not venturing far from the natural entrance.

Hadley's entry into the cave is the first substantiated record of 20th century man's entry into the caverns, although a Forest Service employee during CCC days reportedly recalled that a group of men went into the cave in the early 1900s by wire ladder.

In July 1954, Forest Service Dispatcher Doyle Lawrence went down the natural entrance with a group of men, but they, too, confined their visit to the immediate area.

Roger Bottoms of West Helena, Arkansas, was the first man of record to actually explore Blanchard Springs Caverns beginning in late 1955. He was accompanied by Louis Grobmyer and John Blake, also of West Helena, and Eddie Grobmyer of Forrest City, Arkansas.

On a December 1, 1955 excursion into the caverns, the group found the skull and bones of the early Indian cave visitor and observed a footprint, reeds and a pine torch. Between 1955 and 1961, Bottoms and his party entered the caverns often, spending as long as 38 hours on a visit, exploring passages and looking for another entrance. He was invited to speak at local civic clubs and provided material for newspaper articles published about the cave.

Bottoms made his last exploratory trip into the cave in 1961. For him the trip was very disappointing because of the large number of flash bulbs, tin cans and candy and gum wrappers scattered throughout the cave. "This was in contrast to the first trip into the cave when there was no evidence of anyone having penetrated more than a few feet from the entrance, other than early Indian explorers," Bottoms said.

Two groups of hardy Boy Scouts from Memphis and Oakville, Tennessee, explored far back in the western passage in 1960 and left plaques commemorating their visits.

Also in the late 1950s other spelunking groups were entering the caverns, resulting in some intentional and unintentional destruction of formations.

#### **SHELL AND BRYANT BEGIN EXTENSIVE EXPLORATION**

By this time Hugh Shell and Hail Bryant, spelunkers from Batesville, Arkansas, had heard enough about Blanchard Springs Caverns to have their interest stirred. They first entered the caverns system in March 1960 after erecting a hickory tree rigging over the natural

entrance in order to raise and lower supplies. Two years later Bryant and Shell conducted a fallout shelter study for the U. S. Army Corps of Engineers and included Half-Mile Cave as a possible shelter. Newspaper articles describing the cave again spurred public interest.

Also by this time, recreation planning staff personnel from the Forest Supervisor's Office in Russellville, Arkansas, had visited the natural entrance and planned a trip into the cave to evaluate its recreation potential.

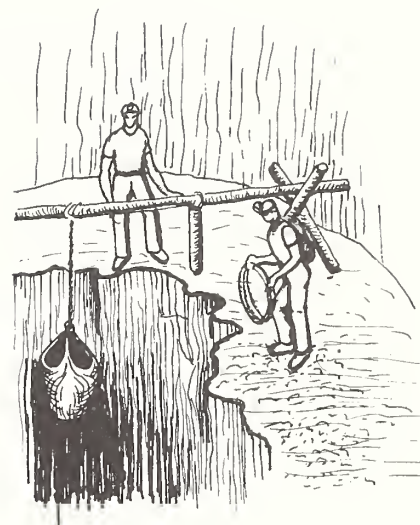
On February 11, 1963, Bryant and Shell took seven Forest Service employees into the caverns. Among the group was Alvis Owen, Forest Supervisor. This trip, and one later in the year to the newly discovered east passage replete with outstanding formations, reinforced the Forest Service's conviction that Blanchard Springs Caverns should be developed as a major recreation attraction on the Sylamore District.

Bryant and Shell gave the Forest Service the benefit of their knowledge gained through 27 excursions into the caverns. They generously made available numerous color slides, photographs, maps and locations of the major features.

The year 1963 also saw other trips into the caverns by Forest Service personnel responsible for planning, surveying and evaluating. The decision had been made to share this immense caverns system beneath the Ozarks with the world. In 1964 the first Forest Service allocation was made for the caverns' preliminary exploration and planning. The figure was \$5,000. The first money appropriated for construction amounted to \$300,000 in FY 1966. Since those beginning years, some \$5 million has been appropriated and allocated for the project.

Getting some national attention on the project was only a matter of time, and not much time at that. In the December 18, 1964 issue, Life Magazine heralded the wonders of Blanchard Springs Caverns, with pictures of the magnificent coral pond, the gigantic column in the Cathedral Room and the icy sheer flowstone some 35 feet high and 150 feet wide. The photographer on assignment for Life sent this note to his editor with the pictures and film:

"I was surprised at its (the caverns') size and the enchantment of its many rooms and formations, which were outstanding in beauty and awesome in some rooms in depth and size. It is the first wild cave I have been in where previous descriptions were not exaggerated, and I believe, when opened to the public, could be as important to national recreation as any of the presently developed caverns in the United States."



**FOREST OFFICIALS  
TOUR PARTS OF THE  
CAVERNS**



## NATIONAL PARK OFFICIALS HELP EVALUATE CAVE

In making the decision to develop Blanchard, the Forest Service had to consider one all-important question: "Is the cave of significant quality for a tourist attraction?" To help answer this question objectively, the Ozark National Forest relied on two National Park Service officials who visited Blanchard in 1963. Both were completely familiar with the two major caves in the national park and monument system, Carlsbad Caverns in New Mexico and Mammoth Cave in Kentucky. Their conclusion was that the Arkansas caverns should be developed as a tourist attraction.

Actually, development of Blanchard Springs Caverns was to differ from federal development at these other caves. Carlsbad and Mammoth both had been explored extensively and had seen commercial operation before the National Park Service took over their operation. Mammoth was discovered in 1798 and saltpeter operations to manufacture gunpowder during the War of 1812 were carried on there on a large scale. In 1837, serious exploration began, followed by a succession of private owners and operators. In 1842 a doctor attempted to establish an underground sanatorium and health resort in the cave to utilize the purity of the air and the evenness of the temperature. Carlsbad was the scene of a bat guano mining venture at the turn of the 19th century, as several companies sought to mine the guano to sell as nitrate-rich fertilizer.

This contrasts with the discovery and initial exploration of Blanchard Springs Caverns, which took place during a time span of only eight years before the Forest Service closed the caverns to the public and embarked upon a program of surveying, mapping and exploration before re-opening the underground attraction to national forest visitors.

In more ways than one, Blanchard has assuredly turned out to be the most extraordinary cave find of the century. With this brief time span between discovery and the decision to develop and conserve the caverns environment, many areas of the cave are still untouched in appearance and will offer the caverns visitor a varied taste of wild, living, unspoiled cave whose darkness and silence are complemented by an inexhaustible array of speleothems (cave formations) millions of years in the making.



# Our Purpose

Blanchard Springs Caverns are a unique recreation opportunity for the Forest Service. They offer a vehicle to demonstrate to the public the expertise of the Forest Service in comprehensive land use planning, facility design, construction and interpretation.

As an interpretive challenge, the Visitor Information Center and tours into the caverns are unequaled among the many outstanding projects now under way in the National Forest system.

There are a variety of recreational opportunities available on the composite. These range from the underground tours to camping in remote areas among the rugged beauty of the hills and along the Buffalo River and White River. All offer the visitor a vacation, a day full of activity or a chance to just sit and enjoy the quiet of the Ozark Mountains.

To retain the qualities inherent in this composite, the Forest Service felt it necessary to define the purpose of the Blanchard Springs Caverns Project.

A quality recreation experience is the primary purpose of the Blanchard Springs Recreation Composite. The quality will be maintained by careful land management practices to retain the forest

environment and encourage a feeling of remoteness from the hustle of the cities—large and small. It will be a place where one can hear the songs of birds while still seeing resource management in action.

Interpretation of nature and early man will provide interesting and educational experiences for the visitor. He will gain a better understanding of his relationship to nature and the many natural systems at work in the world around him. The caverns will be interpreted as a phenomenon of nature. From the translucency of the travertine drapes to fragile helectite formations, the visitor will enjoy beautiful and unique features. He will see the various minerals entrapped in the forma-

tions and experience the massiveness of the columns as well as the delicate lace outlines in the coral pond.

He will be awed by the immensity of geologic time and by the magnitude of such natural agents of erosion as surface and ground water. He will learn to respect the forces of nature through a more thorough understanding of these forces.

He will come away from the caverns with a feeling that he has experienced them—not just seen them. The visitor may develop an individual consciousness that the natural



*The multiple use tree represents forest resources: recreation, wood, water, forage and wildlife.*

heritage we now possess is all that generations to come will have. Thus if we diminish in the least this natural inheritance, future generations will be robbed.

Every opportunity will be capitalized on to involve the visitor personally; through this personal involvement, he, like the geology, the history, the beauty, the animal and plant life, will become a part of the Blanchard Springs Caverns Complex and Composite.

The composite will serve to enhance the economic situation of this section of the Ozarks. The caverns will become an attraction of national significance. The region will experience an increase in tourism as a result of their development.

The composite can serve as a study area and laboratory to add to our basic knowledge of environmental relationships. The caverns and forest area around them present opportunities for scientific investigation. Scientific communities will be encouraged to make full use of the composite for conducting studies into the natural and physical sciences. Exploration of Blanchard Springs Caverns will be encouraged.

The purpose of the composite development, then, is:

- To provide quality recreation with a unique experience in a forest environment.

- To interpret the caverns as a natural phenomenon, and stress the natural features and beauty of the formations, their color, delicacy or massiveness.

- To involve the visitor in the interpretation of the geology, social history and biology of the area.

- To retain the sylvan flavor now inherent in the composite through resource management and land use patterns.

- To demonstrate inter-relationship of natural resources management.

- To enhance the economic situation of the region by increasing tourism.

- To provide a study area and laboratory where scientists can conduct research into the physical and natural sciences.

progress in...

1972

## STUDIES, SURVEYS AND DESIGNS

### Completed:

"Operating and Maintenance Plan Guide" to provide a source of information pertinent to the efficient and economical operation and maintenance of specified buildings, equipment and related facilities on the Caverns Complex. Attention is given in detail to the Visitor Information Center; the Shelter Cave Recreation Area bathhouse, amphitheater, orientation shelter and bathrooms; water, sewage, electrical and telephone utilities, and roads and parking. Sections of the comprehensive plan also look at organization and responsibilities, schedule of infrequently recurring maintenance, schedule of maintenance inspections, method of performing maintenance, operational limitations, financial plan, plans for emergencies, safety and fire plans, controls, and planned future facilities.

### Completed:

"Trail Plan, Ozark-St. Francis National Forests" to assess trail needs for the forests by 1980 and 2000. Planned trail construction for the Sylamore Ranger District outlined in the plan covers 36 miles of hiking trail along the North Sylamore Creek to be constructed between the 1974 and 1976 fiscal years.

### Completed:

Architectural changes, designs and specifications in the Shelter Cave Recreation Area facilities, roads and utilities; the trail to Blanchard Springs, and the interpretive overlook at the springs.



*A contract was awarded in 1972 to complete construction of the Visitor Information Center (top). Shelter Cave Recreation Area visitors will enjoy the bathhouse (center) on the North Sylamore Creek and the amphitheater under the bluff of Shelter Cave.*



**Completed:**

"Blanchard Springs Caverns-Sylamore Ranger District Organization Study" to decide the right organizational structure to effectively and efficiently operate the caverns and the district. On the study team were the Fire Control-Operations Staff Officer, the Recreation Staff Officer, the Forest Engineer and the Administrative Officer (all from the Forest Supervisor's office), the Sylamore District Ranger, the Magazine District Ranger and the caverns Project Engineer. Other members of the Forest Supervisor's staff acted as advisors. The study team considered 10 alternatives for administration of the caverns and district, but only four of those were deemed feasible and were elaborated on in the report.

**Completed:**

"Training Needs, Blanchard Springs Caverns" to assess the training needs of caverns interpretive personnel, security and maintenance personnel, and personnel to handle water and sewage responsibilities. Categories of major training needs listed were Forest Service orientation, district administration, Blanchard Springs Caverns story, cave technology, cave conservation and security, area culture, local and regional information, safety, communications and interpersonal relations.

**Completed:**

"Shelter Cave Recreation Area Interpretive Plan" (see "Progress in Interpretation," Page 23).

**Completed:**

Groundwater tracings of stained *Lycopodium* spores in test drill holes on the proposed motel site on the complex. These tracings confirm the site as undesirable for commercial development of this type since the area is the watershed of the caverns, and contaminated water from such a development could transport bacterial and chemical contaminants into the caverns system. As a result of this study, forest officials have rejected this area as a proposed motel site.

**Completed:**

Hydrology studies and resistivity surveys on the proposed campground near the new entrance road off Highway 14 to the caverns, and other planned development sites, to determine if the sites are the watershed of the underground stream through the caverns system and whether this development would have an effect on the quality of water entering the stream.



Completed:	<p>A report on the surface runoff from the Visitor Information Center parking lot that reveals a direct hydraulic connection between the parking lot storm drains and the cave system. The lot was constructed with infiltration beds beneath the pavement to insure a permanent supply of water to the cave necessary for it to continue growing. But contaminants in the surface water runoff—from gasoline, oil, other petroleum distillates and alcohols—could enter the cave system through solution cavities and fractures. A widely recognized authority on cave formations is quoted in the report as saying: "If drip water is contaminated by parking lot runoff, I think it very likely that the speleothems will receive a thin hydrocarbon film and that this film will disrupt the orderly growth of the crystals . . . every piece of evidence suggests that hydrocarbon contamination will be detrimental to the growth and particularly to the beauty of the speleothems." The report presents several alternatives in approaching and solving this runoff problem.</p>
Completed:	<p>Survey and design for a water collection system beneath the Visitor Information Center parking lot, one of the alternatives recommended in the above report. System includes replacing the natural water regimen of the caverns by sprinkler irrigation of the traffic islands in the lot so as not to upset the natural process of cave formation. Job was advertised in latter part of FY 1972, but bids exceeded allocation. Redesign and survey are continuing.</p>
Completed:	<p>Design of an emergency water pump system for the Visitor Information Center.</p>
Continuing:	<p>Revision of "Blanchard Springs Caverns, A Preliminary Plan of Development" (June 1967) to reflect needed changes in land use and planned facilities on the composite.</p>
Continuing:	<p>"Visitor Information Service Plan for Road and Entrance Zone, Blanchard Springs Caverns Complex" to establish the function of the road and entrance zone in relation to the remainder of the complex, composite and other interpretive units.</p>
Continuing:	<p>Environmental monitoring of the caverns (see "Progress in Cooperation," Page 28).</p>

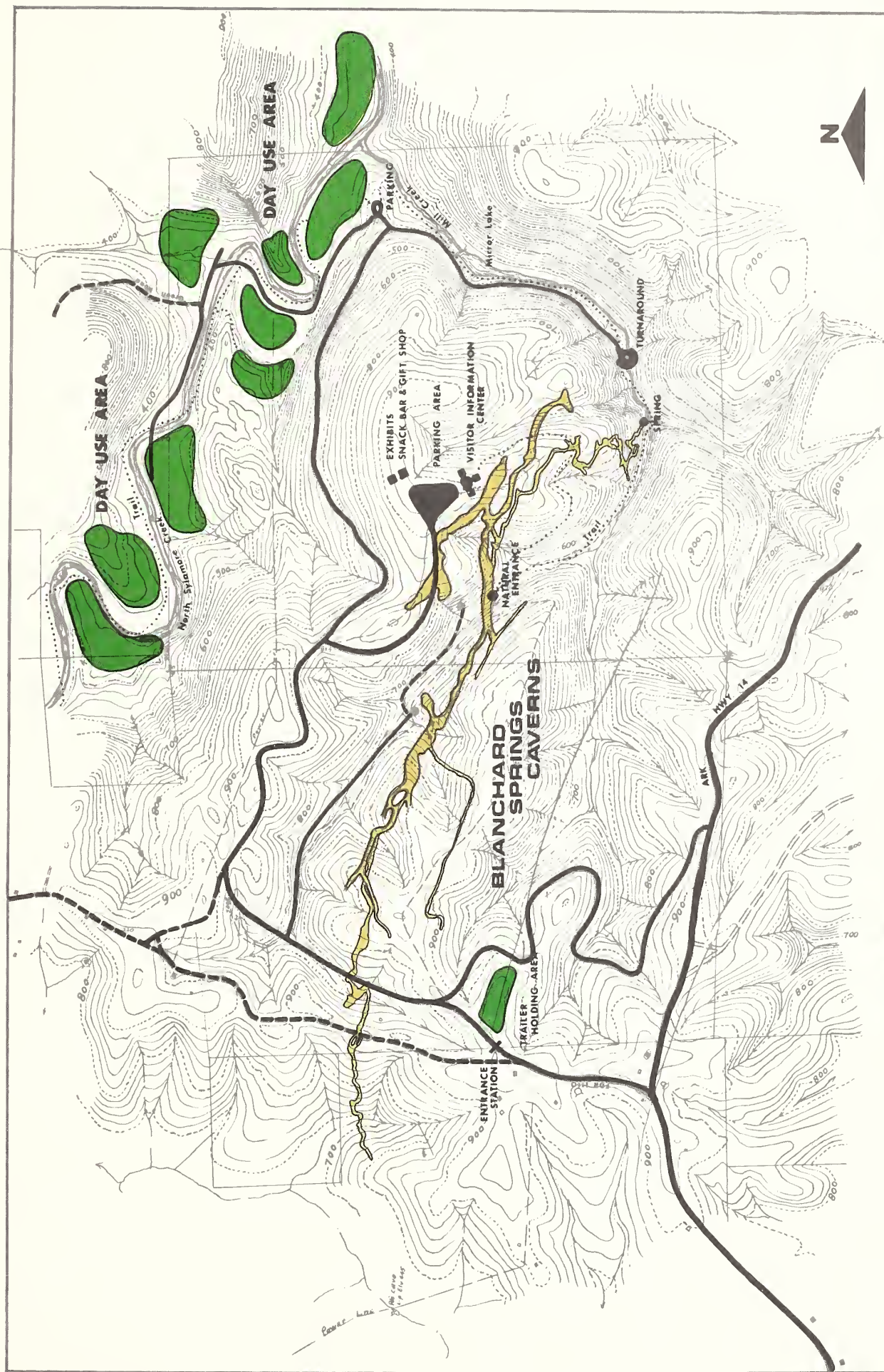
Continuing:	Staffing and organization refinement for Blanchard Springs Caverns and the Sylamore District Ranger's office, with plans to fill 1/3 of the new positions by January 1, another 1/3 by March 1, and the balance by June 1. Availability of housing for summer tour guides is being investigated, and training for these seasonal employees is being studied, with ideas gleaned from similar training programs at Mammoth Cave.
Continuing:	"Fees and Fee Collection Report, Blanchard Springs Complex" to propose user fees in the Shelter Cave Recreation Area and charges for the first cave tour opening in July 1973.
Continuing:	Survey of new entrance road and trailer holding area from Highway 14, connecting with Forest Service Road #1110. This new 1.3-mile access road to the complex is expected to be in use by opening date in July 1973.
Continuing:	Project to map Karst features in the caverns area to aid in defining the groundwater watershed boundary for Blanchard Springs Caverns.
Continuing:	Studies preceding the selection of sites on the composite for solid waste disposal.
Continuing:	Soil surveys on the Caverns Complex to determine suitability of construction in certain areas.

## LAND ACQUISITION

The Forest Service has been actively involved in the acquisition of privately owned tracts in the Blanchard Springs Caverns Complex (and Composite) for several reasons, including:

1. To develop facilities to accommodate the visiting public.
2. To avoid adverse private development.
3. To prevent pollution of the underground stream in the caverns. Surface water enters the cavern system through sink holes, cracks, joints, fissures and other openings in the sub-surface structure.

Action was taken in 1972 to acquire 824.32 acres of private land for any one or a combination of the above reasons. Declarations of Taking were filed January 19, 1972, on 7 tracts totaling 419.19 acres, and 1 tract of 1.01 acres, February 29, 1972. In the meantime, updated appraisals were being prepared for 11 tracts totaling 404.12 acres. Several claims for benefits



**REVISED LAND USE PLAN**

MAP SCALE 1" = 1000'

1000 500 0 1000 2000 3000

Contour Interval 20', T15N - R11W Sec 5&6

8/72



to displaced landowners qualifying under the Uniform Relocation Act of 1971 were processed during this year.

## CONTRACTS AND PURCHASE ORDERS

\$445,500	For completion of the Visitor Information Center complex, specifically the auditorium, exhibit room, landscaping, and lights to be installed in the parking lot. Expected Completion Date: February 4, 1973.
1,620	For construction inspection of the Visitor Information Center. Expected Completion Date: February 4, 1973.
212,235	For construction of 1 mile of road, two bridges (low water and high water) and two parking lots to accommodate a total of 110 vehicles in the Shelter Cave Recreation Area. Expected Completion Date: December 26, 1972.
90,750	For water, sewage and electrical systems in the Shelter Cave Recreation Area, to provide power, a water source and waste disposal for the amphitheater, bathhouse, bathrooms, orientation shelter and parking lots. Expected Completion Date: November 15, 1972.
69,713	For construction of two bathrooms, one in combination with an orientation shelter, in the Shelter Cave Recreation Area. Expected Completion Date: December 18, 1972.
12,000	For interpretive (final) lighting on the Dripstone Trail. Expected Completion Date: January 1, 1973.
8,596	For a total of 2,100 negatives and contact proofs of photographs taken on the composite and elsewhere on the Ozark National Forest. Expected Completion Date: December 31, 1972.
300	For on-site systems review of environmental management. Expected Completion Date: October 15, 1972.
25,318	For updating plans, drawings and specifications on the remainder of the Visitor Information Center complex. Completed.
5,575	For three storyboards and treatments of audio visual program for the Visitor Information Center auditorium. Completed.



\$ 4,473	For drilling of test holes in the caverns area to determine voids under planned development sites. Completed.
2,342	For exploration, mapping and photographing of the underground waterway from the natural entrance of the caverns to Blanchard Springs. Completed.
975	For research and report on geology of the caverns for reference in developing audio visual program for the Visitor Information Center. Completed.
500	For further exploration, compass surveying and mapping of the western passage of the caverns. Completed.

## OTHER 1972 JOBS AND PROJECTS

### Visitor Information Center:

—Construction of main building (1970 contract)	Completed
—Construction of a retainer wall around parking lot above sewage treatment plant	50% Complete

### Dripstone Trail (first caverns tour):

—Paving of trails and tunnels	95% Complete
—Construction of rock veneer walls and surfacing of floor in elevator lobby	Completed
—Purchase and installation of environmental monitoring equipment	Completed
—Installation of drop ceiling in elevator room	Completed
—Epoxy rest area bleachers	Completed

### Shelter Cave Recreation Area:

—Removal of 16 buildings at Blanchard Day Use Area (near new bathhouse) and other site clean up	Completed
—Construction of bathhouse complex (1971 contract)	Completed
—Construction of amphitheater and projection building	80% Complete
—Construction of 200 yards of gravel beach around bathhouse	30% Complete

- |   |              |
|---|--------------|
| —Construction of Forest Service Road #1107 with turnaround parking area | Completed    |
| —Construction of a trail from #1107 parking area to Blanchard Springs   | 98% Complete |

**General:**

- |   |              |
|---|--------------|
| —Writing of prospectus for commercial public service facilities on Caverns Complex  | 50% Complete |
| —Analysis of traffic (automobile and pedestrian)  | Completed    |
| —Acquire tanker truck from Region 5 surplus for the Work Center near Fiftysix, Arkansas, for better fire protection on the district | Completed    |
| —Setting of 35 control markers (for both horizontal and vertical control) in the area of the new Caverns Complex entrance road      | Completed    |
| —Paving of first 1/4 mile of Tour B   | Completed    |
| —Development of alternative routes for entrance on Tour C   | 90% Complete |

**PROGRESS PRIOR TO 1972**

A look at progress, appropriations and allocations year by year since the Forest Service embarked on the development of Blanchard Springs Caverns in 1963:

1963 - 1965 (\$35,000 for planning, preliminary exploration and administration)

The Forest Service undertakes initial exploration, surveying, geologic mapping and planning. Men who had previously made their livelihood working in the sunlight on the forest go deep into the earth to locate, stake and construct trails. A radio survey of parts of the caverns is conducted by the St. Louis University Grotto of the National Speleological Society. On the surface, surveying continues in order to tie the underground work to surface points. Tunnels, test holes and elevator shafts then can be accurately located for future construction. Resistivity studies and hydrogeologic checking of sink holes are also undertaken.

1966 (\$300,000 for construction and land acquisition; \$375,800 for forest roads and trails, and \$8,000 for planning, supervision and administration)

The year 1966 brings the first appropriation for actual construction on the caverns project. The Ozark National Forest immediately begins work on a 125-foot work entrance tunnel opening into the Coral Room. Through this dark access corridor, men and materials find their way into the caverns for further development after work lights are installed. Construction begins on a 4½-mile paved access road, #1110, from Highway 14 to the caverns area, and workmen complete a parking

lot to accommodate 328 vehicles. It will ultimately serve visitors arriving at the Visitor Information Center. This year also marked recognition of the need for extensive ecological study in the caverns.

1967 \$314,000 for construction and land acquisition; \$6,500 for forest roads and trails, and \$9,000 for planning, supervision and administration)

Using the earlier geology surveys, engineers determine the most logical location for the elevator shaft that must house two elevators and equipment, and work gets under way on the 216-foot shaft. At the bottom of the shaft, workmen carve out an underground lobby and connect it to a tunnel that opens into the Cathedral Room. Visitors will get their first feeling of the immensity of the caverns as they step out of this passageway. To protect the delicate environment of the caverns, an air lock door system is installed. This will prevent drying winds from entering the developed area, and it will be replaced later by a modern glass door. The elevator pod constructed over the shaft will contain all the mechanical equipment necessary to run the elevators. After installation of the elevator cabs, the pod is temporarily enclosed, later to blend in with the design of the Visitor Information Center.

Other crews drill a series of test holes, one of which turns out to be productive as a well. An electrical system is installed for the surface. And in the caverns, attention is focused on an unsafe situation in an area of the roof. To avoid any risk to the public, workmen construct a 270-foot bypass tunnel from the Cathedral Room to the Coral Room on the first caverns tour. Construction also begins on the Dripstone Trail route and rest areas, with native stone, cement and other materials brought in through the work tunnel. Ingenious minds devise unusual methods of moving materials from one point to another. A cable car does the job in one location, while motorized wheelbarrows are the chosen mode of transportation along the trails. In a report to the Forest Service on fauna in the caverns, Arkansas Polytechnic College biology student Steve Wilson makes some ecological notes on fauna specimens that he has collected from the cave.

1968 (\$375,000 for construction and land acquisition; \$39,200 for forest roads and trails, and \$9,000 for planning, supervision and administration)

The planning effort intensifies, looking toward adoption of plans to guide development for an opening date in the early 1970s. "Blanchard Springs Caverns Preliminary Plan of Development" outlines the land use pattern and organizes remaining work into phases. Writing continues on two major interpretive plans, "Interpretive Study for the Blanchard Springs Composite" and "Interpretive Plan for the Dripstone Trail." The latter document will help in determining the location of interpretive lighting.

1969 (\$538,000 for construction and land acquisition; \$155,000 for forest roads and trails, and \$13,500 for planning, supervision and administration)

Further exploration and flora and fauna are emphasized this year. The St. Louis University Grotto receives a contract to explore, survey and map the rooms, passages, streams, geology and biota beyond the area known as "The Titans" in the western passage. Memphis State University biology faculty members and students working under them make excursions to the Sylamore Ranger District to study, identify and collect amphibian, reptile, mammal and plant specimens, resulting in a Forest Service contract for listings of these species. The endangered Indiana bat is found in the



cave and steps are taken to limit its collection. Discussions with experts follow on how to preserve this and any other endangered species occurring in the caverns. An examination of 25 bats taken from the caverns revealed a negative report for rabies from the Arkansas Health Department.

A contract is awarded this year to two firms with planning, architectural and engineering expertise to analyze the various opportunities for private capital investment within the recreation composite and to develop recommendations for the most feasible commercial public services based on economics and service to the public. The feasibility study also looks at anticipated visitation patterns and economic impact. The year 1969 also sees advances in construction, as evidenced by a 200,000-gallon reservoir near Mill Creek in the Shelter Cave area. Another reservoir with the same capacity is in one of the islands in the Visitor Information Center parking lot. The sewage treatment facility is designed on a compartmentalized system to allow for the addition of more units. Construction gets under way on a natural stone bridge between the elevator lobby and the Cathedral Room.

1970 (\$576,000 for construction and land acquisition; \$35,000 for forest roads and trails, and \$49,000 for planning, design, supervision, administration and Green Thumb support)

An architectural firm designs the Visitor Information Center, and after several changes in the design, it is approved. Beneath the surface, the Driestone Trail gets an electrical system in preparation for the final interpretive lighting that will point out significant features and create a general effect of awesome beauty. To provide visitors access to the springs, the Forest Service constructs a road with turnaround and parking area for about 20 vehicles. A trail to the springs is planned. Green Thumb workers, men over 55, began rehabilitating public use areas on the forest. Landscape architects start preliminary designs for the Shelter Cave Recreation Area, which will be the nucleus of day use activities on the Caverns Complex. Included in the plans are a bathhouse, swimming and beach areas along the North Sylamore Creek, bathrooms, orientation shelter, picnicking units, an amphitheater for special interpretive programs, parking areas, hiking trails, nature trails for special nature walks and lectures, and campgrounds nearby. Problems develop in the elevator shaft, as groundwater pours into it and the underground lobby. A contract is awarded to grout and seal the shaft before rust and corrosion destroy the equipment.

1971 (\$100,000 for construction and land acquisition; and \$23,000 for planning, design, supervision and administration)

More detailed designs are approved for roads, parking and utilities in the Shelter Cave Recreation Area, and actual construction begins on the bathhouse and amphitheater. This year also sees construction start on the Visitor Information Center main structure and hallway to the elevators.

1972 (\$989,500 for construction and land acquisition, and \$212,200 for forest roads and trails)

See beginning of this section for accomplishments in 1972.

1973 (\$895,000 for construction and land acquisition; \$102,000 for protection and maintenance, and \$179,000 for forest roads and trails)

See Page 43 for jobs to be accomplished in 1973 with these funds.

**PROJECT TOTALS, 1963-1973:**

Planning, Preliminary Exploration, Supervision and Administration	\$ 146,500
Construction and Land Acquisition	4,087,500
Forest Roads and Trails	1,002,700
Protection and Maintenance	<u>102,000</u>
TOTAL	\$5,338,700

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# INTERPRETATION

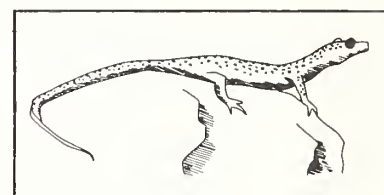
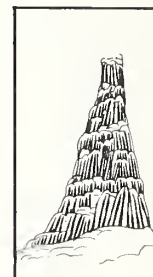
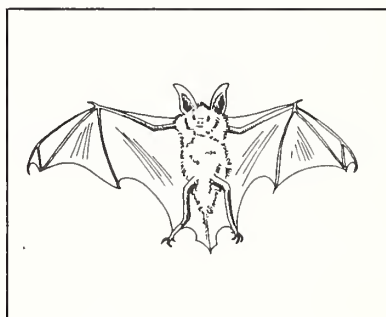
"Blanchard Springs Caverns are a unique natural phenomenon, the magnitude of which will likely be misunderstood, uncomprehended or unappreciated unless there is an outstanding job of on-the-ground interpretation," states the comprehensive "Interpretive Plan for the Blanchard Springs Caverns Visitor Information Center" approved during 1972.

In fact, interpretation is a recurring word in this year's progress as the opening of the caverns draws nearer. Besides the Visitor Information Center plan, the year 1972 saw the completion of another major interpretive plan, one for the Shelter Cave Recreation Area on the Caverns Complex.

These programs of action represent a mammoth study and writing effort on the part of two interpretive planners, as they consolidated objectives, plans, guidelines and recommendations for use in approaching the interpretation of both the Visitor Information Center and Shelter Cave area. Both plans expand ideas on Visitor Information Services outlined in "The Interpretive Study for the Blanchard Springs Composite" of 1969.

Since its approval on the Forest and Regional Office level, the Visitor Information Center (VIC) plan has been consulted continuously as plans move forward for the audio visual program and exhibits in the complex that will introduce the visitor to Blanchard Springs and orient him to activities and attractions that can be reached by foot and automobile.

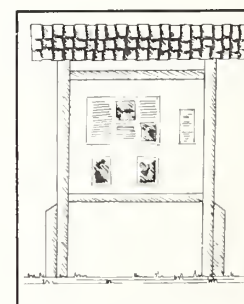
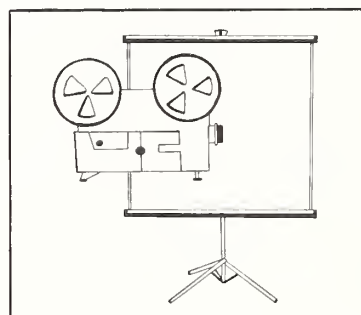
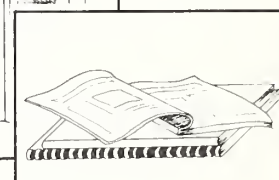
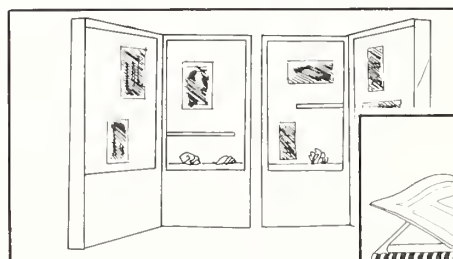
Detailed in the document are interpretive concepts, functions and orientation stories for each of the five components of the VIC: the main lobby, which welcomes the visitor; the auditorium, where an audio visual program will enhance the visitor's knowledge and understanding of the natural forces that created the caverns; the exhibit room, in which visitors will experience the total cave story through a "Life in the Dark" theme; the hallway, where discoveries by



INTERPRETIVE STORIES



INTERPRETIVE MEDIA



INSIGHT AND  
APPRECIATION



man—of new and different environments, Blanchard Springs Caverns and other types of caves—will form the interpretive concept; and, finally, the elevator lobby, where interpretation as a part of the caverns tour begins.

A contract for completion of the VIC building—to construct the exhibits room and auditorium on each side of the main building—was awarded during 1972 while progress was being made in exhibit design and audio visual treatment.

Preliminary design sketches and preliminary copy for the exhibits, completed in 1972, form an interesting and informative interpretive story about limestone caverns, their geology, biology and man's relationship to them.

The Forest contracted for and received three treatments and storyboards for the audio visual program envisioned for the VIC auditorium. It will dramatize the story of how Blanchard Springs Caverns were formed, condensing millions of years of history into fewer than 15 minutes of film. The treatments submitted for the short film were creative and innovative—ranging from suggested animation treatment to a documentary approach. Now all that remains is for the Forest Service to choose from among these presentations and begin final negotiations for the audio visual contract.

Anticipating a need for an inexhaustible supply of photographs of Blanchard and the area for exhibits and publications, the Forest awarded two contracts for photography work in 1972. The 2,100 color negatives resulting from these contracts will find their way into a recreation map of the Sylamore Ranger District, a brochure on the caverns, and displays throughout the VIC building and on outdoor display panels in the Shelter Cave Recreation Area.

Shelter Cave Recreation Area offers the Forest Service seemingly infinite opportunity for interpreting the social, cultural and natural history of the area and National Forest resource management. Day use and overnight visitors will find facilities there for camping, picnicking, swimming, fishing, hiking, nature programs, nature walks, and other recreation activities. An estimated 233,000 persons will be visiting this site by 1975.

The central interpretive theme chosen for the Shelter Cave area is water and how it shapes the destiny of the land and people in the Ozarks. When the ambitious Shelter Cave Interpretive Plan is implemented as recommended, more than 90 potential interpretive stories, all related to water and ranging in subject matter from fossils to pioneer entertainment, will be told to the visiting public through

## EXHIBITS ROOM AND AUDITORIUM WILL COMPLETE VIC









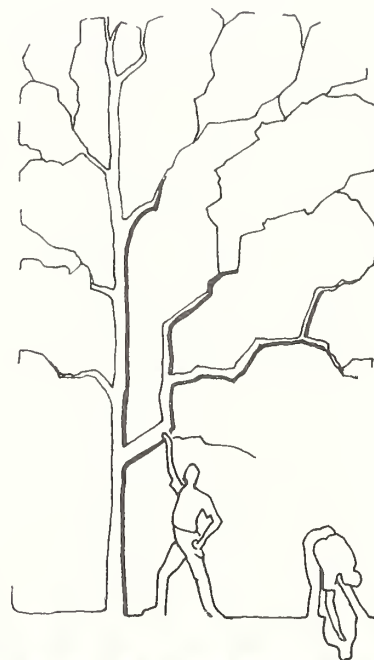
outdoor exhibits, audio visual programs in the amphitheater, demonstrations, brochures, sale items, interpretive signs and both conducted and self-conducted tours.

"Never before has such an opportunity presented itself to discuss in length the effect that water, a renewable resource of the forest, has had on the entire course of history and the work of the Forest Service to manage it for the greatest good for the future," the plan points out. Priority ranking is assigned to the interpretive stories in the plan's inventory so those considered most essential will receive attention for possible development before next July's opening date.

Three other projects related to interpretation saw progress in 1972. A contract was awarded for design and installation of an illumination system in the caverns, and Green Thumb workers completed the pedestrian bridge and continued work on the 1/4 mile interpretive trail to Blanchard Springs. Work began on an interpretive plan for the road and entrance zone on the Caverns Complex, outlining administration, movement of visitors and orientation as the main functions of this zone.

Believing that the caverns visitor should see and feel the natural attractions in the most natural way, the Forest Service contracted in 1972 for a lighting system along the Dripstone Trail that steers clear of artificial or unnatural color "show." Several display and lighting techniques using white light and daylight quality light sources will be used at strategic interpretive points along the 3,840 feet of trail on the first tour to enhance the interpretation by tour guides at major formations and orientation seating areas.

Working on the Blanchard Springs Caverns Complex since 1969, Green Thumb workers have gained a reputation throughout Arkansas for the quality of their work whether it is hiking trails, scenic overlooks, highway or public building beautification. Green Thumb is a program for chronically unemployed men over 55, sponsored by the Arkansas Farmers Union. Average age of the workers is 69.





*Green Thumb workers watch as dignitaries formally open the pedestrian bridge to Blanchard Springs.*



*Visitors using the winding bridge pass beneath sun-shielding sycamore, dogwood, oak and elm trees.*



In addition to building a pedestrian bridge, laying the concrete and doing the masonry work on the scenic trail to Blanchard Springs in 1972, Green Thumb almost completed construction of an interpretive platform at the trail's end. The platform will have a seating area where visitors can rest, view the springs in the side of the limestone mountain over the caverns, and be exposed to such interpretive stories as how the old mills used the water for power and how scuba divers entered the springs to explore and map some 4,000 feet of mysterious, watery caverns. In the planning stage during 1972 have been interpretive programs and signs for the trail.

In February, Green Thumb members had an opportunity to show off their quality handiwork as ribbon-cutting ceremonies were held for the curving wood bridge that takes visitors to the springs over the creek. Special guests for the event were U.S. Representative Bill Alexander and Lewis J. (Red) Johnson, President of Arkansas Farmers Union.

Also during 1972 Green Thumb stayed busy adding curbing to the parking lot near the Shelter Cave Recreation Area and at the turnaround and parking area near the springs. They also continued some rehabilitation work at Gunner Pool and Blanchard Springs Recreation Areas.

progress in...

# COOPERATION

The Forest Service has enjoyed continuous support and cooperation from individuals, institutions and public and private groups in the development of Blanchard Springs Caverns, and 1972 is no exception, especially in the case of individuals lending their expertise to the project.

Two men, whose services were lent to the Ozark National Forest by other forests in the Southern and Eastern Regions, have advanced the ecological effort inside the caverns and the interpretive effort outside the caverns.

Tom Aley, hydrologist on the Mark Twain National Forest in Missouri, was called in to consult on groundwater systems feeding the underground stream. In the process, he also looked at the problem of unwanted plant—algae, moss and fern—growth caused by electric lighting in the caverns. Aley has a special interest in caves, their animal and plant life.

During a visit to Blanchard, Aley and Dr. Paul L. Redfearn, Jr., of the Department of Life Sciences at Southwest Missouri State College, collected 18 species of algae, moss and ferns found deep in the cave where they received no sunlight—only electric light.

Dr. Redfearn felt that the plant growth problem would worsen, but both men expressed concern at attempting plant control with physical abrasives, since they tend to damage beautiful speleothems, or with poisons that would find their way into the underground stream.

The only alternative seemed to be the use of steam under moderate pressure, Dr. Redfearn concluded, and Aley conducted some research and a “kitchen” experiment before testing the steam in the caverns. He collected some very delicate aragonite soda straws and other formations from a cave and subjected them to steam from a teakettle. “I steamed them and boiled them until my wife ran me out of the kitchen, and I can’t see that I hurt them at all,” he reported. With the blessings of everyone on the Blanchard Springs Caverns Project, Aley entered the caverns in 1972 to test a portable kerosene-fired steam generator obtained from a rental agency. It would be an understatement to say that the generator had seen considerably more use cleaning dirt and grease from lawnmowers than it had cleaning plant growth from cave formations.





## ALEY TRIES STEAM SPRAYING ON FORMATIONS

The Mark Twain National Forest hydrologist chose three rock formation areas for steam spraying, which took about 10 minutes per square meter of surface area. After five months, Aley revisited the cave and examined the sprayed areas. He found one area devoid of plant material, and the other two had a substantial amount of dead moss, although both contained some live plants. He deduced that a more suitable steam generator would have killed all the plant growth. Aley also examined closely, using a hand lens, the calcite crystals in the flowstone that was sprayed. He could not detect any damage to the crystals by the spraying.

Aley recommended that the Ozark National Forest consider purchasing or renting a portable steam generator to control the unwanted plant growth caused by the introduction of electric lights in the caverns. This is being investigated by the project engineer, as a part of the work program for FY 1973.

Since a key to a cave's environment is its water system, Aley has also played an important part as a consultant on the environmental monitoring program initiated at Blanchard Springs Caverns in 1972. The Ozark National Forest asked the young forester to draw up a monitoring proposal since he had gained experience with this type of instrumentation while on the Hurricane Creek Barometer Watershed Project.

In the case of Blanchard Springs Caverns, Aley pointed to three problem areas where environmental monitoring would be of value—to measure: (a) changes in quality and quantity of cave waters due to changes in surface land use; (b) changes in cave temperature, humidity, air movement and formation water regimens due to heavy cave use, and (c) changes in cave fauna populations due to cave use.

He predicted degradation of the water in the underground stream unless the Forest Service became significantly involved with water quality considerations, taking steps to locate the watershed for the caverns and protect it from sewage disposal, dumps, feedlots, gas spills and other pollution.

Aley also suggested that heavy use of the cave by visitors might alter the cave's microclimate: temperature, relative humidity, air movement and water supply for the still-growing formations. Monitoring now, he proposed, would establish these microclimate conditions and would be helpful in making later predictions and judgments on the effects of heavy use of the cave by the public.

Bats in the caverns are the largest suppliers of food, in the form of bat guano, for the fauna living in the dark subterranean world. For





this reason, Aley suggested that, if the bat population and its habitat could be maintained in the cave, then much of the native cave fauna could also be maintained.

The summer was spent installing sensitive, sophisticated monitoring equipment in the caverns: stream gaging instrument, air and water temperature recorder, thermistor psychrometer, wind register system, cave and surface microbarographs, dripstone water flow register system, surface precipitation and air temperature recording gauges, hygrothermograph, and thermocouples, thermopiles and recorder for cave air temperature.

In September, University of Florida systems ecologist, Dr. Samuel C. Snedaker, entered the Blanchard ecological picture when the Forest Service contracted with him to review the monitoring system and give advice on interpreting the monitoring results. Snedaker has already prepared a first-approximation energy model of the cave ecosystem and is considering the merits of analog computer simulation as a Forest Service management tool and/or a device for public instruction in cave ecology.

While Aley tended to the cave ecology, Interpretive Planner Jeff E. Carroll of the National Forests in Alabama was engaged, on a special work detail, to write an interpretive plan for the Shelter Cave Recreation Area. Carroll, known throughout the Southern Region for his creativity in interpretive planning, devoted his efforts over a period of about six months to first studying, reading, interviewing and assimilating, then to writing the voluminous interpretive plan completed in June.

Karen Crissinger, a Girl Scout in Prattville, Alabama, received a letter of commendation from Forest Supervisor Larry D. Henson for her assistance to Carroll on the project. After fulfilling requirements for certain badges, she continued to work on her own time and volition until the project's completion.

Another strictly volunteer effort undertaken in 1972 was by Gary Tucker of the Biology Department at Arkansas Polytechnic College. Tucker has studied extensively the flora of Arkansas, and in 1971 he received a Forest Service contract to make a checklist of vascular plants occurring in the Mt. Magazine area. Eventually he became interested in the Sylamore District and thought he could add to the species already identified as occurring on the Caverns Complex. In 1972 he located a spot east of the caverns, in the vicinity of Barkshed Recreation Area, that contained a number of species not found elsewhere in the state. These include the white trillium, the rare and beautiful showy ladyslipper (an orchid native to the Ozark region),



WHITE TRILLIUM



grass-of-parnassus, running strawberry bush, alternate-leaved dogwood, ague weed and arrowwood. He also suggested that this area with its diverse flora should be preserved against any future development that would endanger these rare species. The Ozark National Forest is following his recommendation and making sure that this Barkshed botanical garden is not sacrificed during the course of resource management on the Sylamore District.

The year 1972 produced another volunteer worker in the form of Richard D. (Dick) Murray, 66-year-old Corps of Engineers retiree and Ozark Society member who makes his home in Fayetteville, Arkansas. As soon as the Volunteers in the National Forests Act of 1972 was approved in May, Murray showed up at the Forest Supervisor's office offering his services in laying out foot trails and horse, or bridle, trails on the forest. The outdoors enthusiast was immediately assigned to an area on the Caverns Complex, where a group of Green Thumb workers are grading the trails as Murray decides where they should be. When he isn't doing volunteer work for the Forest Service, canoeing on the Buffalo River, and arranging backpack trips for Girl Scouts and other groups, Murray dreams of someday laying out a "trunk," or foot, trail across the Ozarks, from Tahlequah in Oklahoma to Batesville in Arkansas, some 350 miles of trail.

progress in...

# UNDERWATER EXPLORATION

While Half-Mile Cave began its metamorphosis to Blanchard Springs Caverns, a national recreation attraction, the Forest Service realized there were still some baffling questions to be answered about this subterranean environment. And most of these questions have centered around the watercourse through the caverns' lower passage, especially the portion between the natural entrance and the open air springs exit. Stories about children throwing cornstalks into the natural entrance and not seeing them emerge until almost 24 hours later at the springs stimulated the Forest Service to conduct its own tests. Instead of cornstalks, dye was put in the water inside the caverns at the natural entrance. Twenty-three and a half hours later, water containing the dye poured out at the springs.

The year 1972 finally produced some answers and explanations as three geology students from Memphis State University completed exploration, under Forest Service contract, of the underground watercourse, some 4,000 feet of caverns—and 1,000 of that completely underwater.

Glenn Thompson, the student leader of the exploration, mapping and photography scuba diving expedition, and his co-workers, Robert Langford and Chip Reed, became the first persons to travel completely the watercourse.

They detail their findings in a report submitted in April, accompanied by photographs and a map. Their account of the journey makes for fascinating reading.

They traveled one underwater passage as long as three football fields and only 2 to 3 feet high. Mud crawlways had to be negotiated that were less than 2 feet high.

Dangerously deep—12½ foot—potholes were more than capable of swallowing the unwary scuba divers and their bulky equipment: air tanks, swim fins, face masks, flashlights, reels of measuring tape, survey lines, knapsacks, compass, clipboard, graph paper, pencils, underwater camera, airtight ammunition box (to carry the land camera), tripod and plastic bags for geology specimens. From lengthy (several hundred feet long) passages full of water, the men would emerge in small chambers with only 2 feet of airspace, then go on to explore passages containing no more than 1 or 2 feet of water.

To conquer a 5-foot waterfall, they carried a burdensome 12-foot ladder into the springs, only to discover a way to crawl around a side passage.





Despite the natural obstacles, the dangers and the numerous problems encountered with mapping equipment and techniques, what the Memphis State students found was well worth the effort and a \$2,342 Forest Service expenditure. On eight weekend trips to Blanchard Springs Caverns between September 18 and December 5, 1971, the Thompson, Langford and Reed expedition discovered five air-filled rooms in the course of the 4,000 feet. The contrast in size of the rooms was stupefying. The largest measured 320 feet long, 50 feet wide and up to 40 feet high, while a corridor reminiscent of a sewer pipe was only 4 feet wide and 6 feet tall.

In the underground watery world, the three students pioneered a different kind of trail in the Ozarks. Their flashlights revealed and their cameras focused on the silent beauty hidden from generations of curious Ozark dwellers:

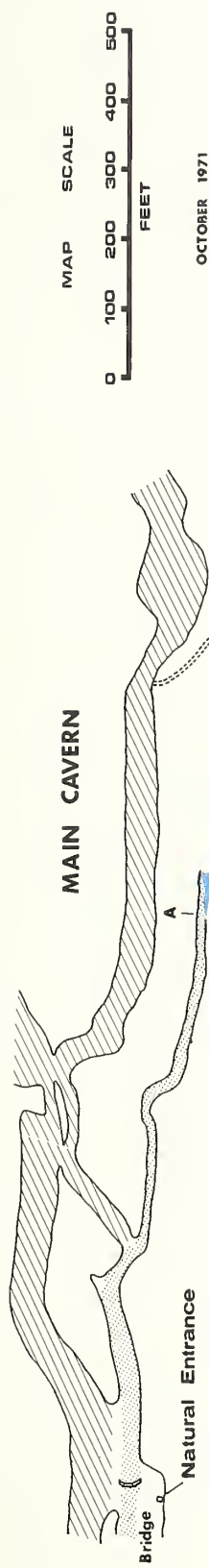
- Gleaming gold rimstone dams through which the water drops 14 feet in elevation over steplike terraces in the course of 300 feet.
- Magnificent formations in the Glass Menagerie Room, where icy crystal soda straws, some up to 5 feet long, decorate a ceiling, whose decor also features more massive red, gold, brown and white stalactites.
- Delicately and abnormally twisted helictes

that invade the soda straw territory and grow defiantly from the icicle formations, like eyes of a potato too long in the potato bin.

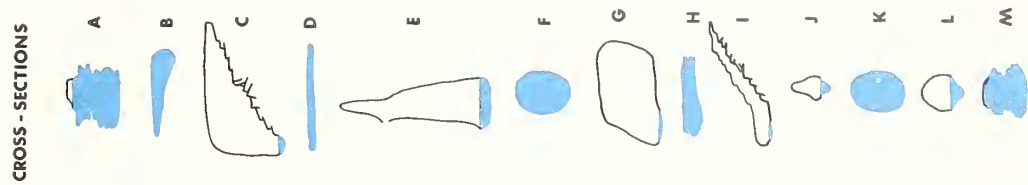
- Massive draperies with their breakfast bacon colors and patterns, suspended from a 60-foot ceiling, almost touching the water.
- The waterfalls inside the mountain, where green water on its journey to daylight cascades over orange-colored limestone rock.
- And the still, deep, water-filled passages where the stream—and children's cornstalks and Forest Service's dye—flows at a snail's pace of 9/10 of a foot each minute.

In other words, starting beneath the natural entrance, it takes the water in the stream an estimated 18 hours and 30 minutes to flow through that 1,000 feet of passages completely filled with water. This contrasts with the 5 hours and 12 minutes it takes for the water to flow through 3,000 feet of both deep and shallow free surface streams through the caverns.

During prolonged periods of heavy rain, the water velocity may increase from 12 feet a minute to 50 feet a minute or more in the shallow areas.



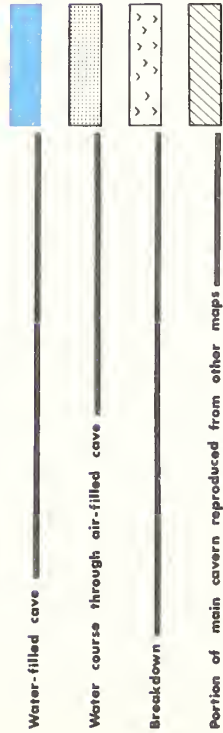
DIRECTION OF WATER FLOW



# **UNDERGROUND WATERWAY** **IN** **BLANCHARD SPRINGS CAVERNS**

OZARK NATIONAL FOREST  
STONE COUNTY, ARKANSAS

## **LEGEND**



Cross-section scale approximately 3 times the map scale.



**progress in...**

# **AREA PLANNING & DEVELOPMENT**

"The year 1971 was much more than one of progress for Stone County. It was one of transformation from plans and ideas to one of action and actual development.

"For years plans had been made for development of Blanchard Springs Caverns near Fifty Six and the Ozark Folk Cultural Center at Mountain View as major tourist attractions. And 1971 became the year for all those plans to materialize into something that could be recognized as a reality—promising a historic economic boon in the area."

—THE ARKANSAS GAZETTE  
January 1, 1972

"The City Council agreed Tuesday to re-establish a joint City-County Planning Board, and will possibly meet in the next few days to appoint new members to the commission.

"The move is the first of a four-part plan now being considered by the Council as one method of establishing planning for the orderly growth and development of the city.

"The need for such action has been recognized by the Council as necessary to cope with expected growth that will be generated by the opening of the Cultural Center here and Blanchard Springs Caverns."

—STONE COUNTY LEADER  
May 25, 1972

"Agency services will aid local efforts to develop tourist service industry and business, members of the Ozark Gateway Tourist Council were told at a meeting last week.

"Representatives from the State Parks and Tourism Department, Small Business Administration, and the White River Planning and Development District said Stone and the surrounding five-county area needs to build for the influx of tourists which is forecast after the opening of the Ozark Folk Cultural Center and Blanchard Springs Caverns."

—STONE COUNTY LEADER  
July 6, 1972





*Ozark Folk  
Cultural  
Center  
Auditorium*

"City officials of Mountain View, Stone County officials, Forest Service representatives, Mountain View civic leaders and Arkansas Green Thumb administrators met last week here to discuss a gigantic, county-wide cleanup and beautification campaign . . .

"This will be a pilot program that, hopefully, could be repeated in other Arkansas counties. Stone County was defined as the ideal place for a pilot program since it will emerge soon as one of the top tourist counties in the state. It is expected that when the Blanchard Springs Caverns are opened in July of 1973 more than a million tourists will visit the county annually."

—THE ARKANSAS  
GAZETTE  
February 29, 1972

*Laminated beams overhead dominate this inside view of the 1,060-seat cultural center auditorium.*





## 522,000 VISITORS ANNUALLY BY 1975

These and similar reports appearing during 1972 give an indication of the impact that Blanchard Springs Caverns and the Folk Cultural Center have had on area economics, development and planning.

A number of economic impacts will continue to be felt by Stone County and surrounding counties as an estimated 522,000 visitors pour into the Caverns Complex by 1975 to take cave tours and use the recreation facilities in the area. Forest Service recreation and tourist development on the composite is helping boost the area's spending, employment and personal income. Visitation is expected to reach a peak of 972,000 by the year 2000, and these visitors will spend an accumulated total of \$20 million by 1975 and a total of \$240 million by 2000. Placed in terms of net personal income, the estimated increase in accumulated net personal income would be \$100 million by the year 2000. These figures, all from the feasibility study, are staggering when one considers the fact that per capita income in the Ozarks in 1968 was \$600 below the national average.

In addition, studies on population and economics by the White River Planning and Development District, which includes Stone County, predict that the Blanchard development, coupled with the Folk Cultural Center and nearby recreation and retirement developments, will form leisure-time industrial "bases" attracting other businesses related to recreation. "In time, light manufacturing activity will locate in these areas as community services, as well as transportation facilities, are improved through the economic uplift produced by the leisure-time industry," says a 1971 White River Planning and Development District study.

In Stone County, which had a population of 6,836 in 1970, the population forecast is 7,233 by 1975, 8,284 by 1980 and 12,574 by 1990. Mountain View — 1,866 in 1970 — is estimated to fall between 2,000 and 2,500 in 1975, between 2,500 and 3,000 by 1980, and 4,000 to 5,000 by 1990.

Groundbreaking ceremonies in September 1971 during the first quarter of FY 1972 preceded construction of the sprawling Ozark Folk Cultural Center located 3/4 of a mile directly north of the Mountain View town square. Financing for the \$3,390,000 57-building facility came from the Economic Development Administration in the form of 80% grant and 20% loan.

To the people of Stone County and the Ozarks in general, the center is a dream come true since it will be a means of preserving the folk-life, arts, crafts, music and folklore of this "yesterday today" country. Jimmy Driftwood of Timbo, Arkansas, nationally known



balladeer of "Battle of New Orleans" fame, led a group of folk musicians to Washington in 1963 to ask for federal money for a national center at Mountain View to preserve what is left of American folklore.

Facilities on the 80-acre center development include a 1,060-seat auditorium, a reception center, buildings for some 24 arts and crafts, dining accommodations, continuing education center, cafeteria, 15 student dwelling units, recreation and swimming pool building, arts and crafts skill training center, laundry, garage and shop, and parking area.

Construction of the native stone and western cedar complex is scheduled for completion in December 1972, with opening date set for April 1973. In May the Arkansas State Department of Parks and Tourism agreed to purchase for \$110,000 the 10-year operating lease of the center from Advanced Projects, Inc., of New York. Formal approval of the lease agreement was given in June by the Ozark Folk Cultural Center Commission and the Economic Development Administration.

Before taking over the lease, which has six 5-year renewal options, the State Department employed a consultant to conduct a feasibility study. The consultant advised the state to purchase the lease and operate the center since he felt it would induce new tourists to come into Arkansas.

The State Department is planning a 600-acre park around the center, with some 100 camping units for the April opening. Main access to the center and state park will be by a new half-mile-long state road constructed in 1972 by the State Highway Department off Highway 9.

With Blanchard Springs Caverns and the Ozark Folk Cultural Center progress stimulating optimism for economic improvement, Mountain View and the surrounding area have seen a record number of new home starts, a new high in school enrollment, a new high in savings and checking account bank deposits, a record number of highway construction contracts to rebuild and reroute narrow, winding Ozark roads, and a record number of prospective real estate buyers.

The concern of city officials over the orderly growth of their community, as it stands on the threshold of a new economy based on tourism, has been effectively channeled into productive and progressive effort—action in both immediate construction and development and in planning for the future.

The City-County Planning Commission, reactivated in May, has

## **FACILITIES COVER SOME 80 ACRES**

## **STATE OF ARKANSAS PLANS 600-ACRE PARK IN AREA**

already undertaken a comprehensive master plan for zoning and guidelines for development.

## COMMISSION BEGINS MASTER PLAN

At the direction of the City Council, an architect is preparing plans and specifications for a proposed \$125,000 community center with a swimming pool, tennis courts and recreation facilities for both youthful and senior citizens. City officials envision this center on 2½ acres north of the town's hub, and they hope to qualify for federal funds to finance its construction.

New schools are in the future of Mountain View School District students, after very detailed and thorough planning in 1972. The School Board is purchasing a 93-acre tract of land adjoining the hospital site 2 miles east of town on Highway 14. School Board approval was given to phase 1, an elementary school, after an architectural and engineering firm submitted a plan for a development program utilizing the entire tract. Residents will consider a bond issue to finance phase 1 next March. Phase 2 is a new high school building, and phase 3 consists of a vocational school and possibly a community junior college.

Other planning and development in 1972 by Mountain View:

- Completion of a new City Hall and Fire Station, which provides space for city offices, conferences, the Water and Sewer Department and the city jail.

- Announcement of plans for a new shopping center, with some 28,000 square feet for a Piggly Wiggly store and other businesses, to be built on a site near the junction of Highways 5, 9 and 14. It is the first such planned development in Mountain View.

- Start of construction on a 17,800-square-foot supermarket, with delicatessen, also near the junction. Plans are to open around January 1973.

- Plans by the Ozark Gateway Tourist Council, covering six counties, for promotion advertisements and studying ways in which newly allocated state funds could be secured for tourism promotion.

- Discussions by the Soil Conservation Service of the U.S. Department of Agriculture concerning the proposed development of recreational lakes for the city and county, with about 75% of the anticipated cost to come from federal water conservation funds.

Progress in the surrounding area includes:

- Purchase of 1,200 acres by Eastman Kodak Corporation outside



Batesville, 38 miles east of Mountain View, and plans to construct a plant to be operated by the corporation's Chemical Division.

—Appropriation of \$75,000 from the State Board of Education for an area vocational-technical school at Melbourne, 27 miles northeast.

—Beginning of construction on a 75 by 40 foot building to be leased by the Forest Service for offices of the Sylamore District Ranger, his 14-member staff and district support personnel for Blanchard Springs Caverns. The 3,000-square-foot facility is located on Highway 14 toward the caverns in the Mountain View city limits. Completion date is February 1, 1973.

—Continuation of old, and beginning of new, projects to improve about 80 miles of state highways in the area. A contract for \$1,264,455 was awarded for improving and rebuilding 6.26 miles of Highway 14 from Allison (seven miles north of Mountain View) to the Blanchard Springs Caverns access road, #1110. The project entails grading, resurfacing and building a composite beam bridge across the Sylamore Creek. Work continued on a 9.5-mile section of the new Highway 5 from Optimus to Allison, to complete a \$1.1-million, 15.8-mile section of Highway 5 from Calico Rock to Allison. All surfacing is expected to be complete by December 15. Another contract is expected soon for the rebuilding of 6¼ miles of Highway 14 from Allison to Mountain View to complete the caverns access road system. Another contract awarded in 1972 was for resurfacing of Highway 66 west of Mountain View to Leslie, some 30 miles away. Improvements being made on Highway 65 between Leslie and Marshall, about an 8-mile stretch, are part of major alterations and repairs to improve the route from Springfield, Missouri, to Little Rock. The paving of 18 miles of Highway 9 from Sylamore to Melbourne was completed this year, and work continues on construction of a bridge across the White River at the northern tip of the Sylamore Ranger District. The new bridge will connect with Push Mountain Road, #1100 on the district, and Highway 5 north of Norfolk across the river.

—Beginning of development on two projects that will provide overnight public accommodations for the stream of tourists expected when the caverns open. Thirteen miles west of the Caverns Complex entrance road, on Highway 14 near Big Flat, the 400-acre Champagne Acres Campground will open in July. Some \$225,000 in development will produce 500 campsites, picnicking and recreation facilities, an amusement park and a restaurant seating 150 persons. Future plans are to add a 100-unit motel, a lake with a beach area, hiking trails through a canyon on the site, a special area for camping clubs, with a community building, laundry, grocery store and other facilities.

The other project, Sylamore Creek Development, will eventually cover about 80 acres near Allison in the vicinity of the old suspension bridge and the newly rerouted Highway 14 toward Blanchard Springs Caverns. Construction began this year on the \$400,000 first phase for opening in April 1973. Phase I is a Holiday Inn Trav-L-Park, including 128 campsites, a general store, swimming pool, game room and facilities for recreation activities, such as horseback riding and volleyball. Plans are to start on Phase 2 in 1973, to open in 1974. This phase will see construction of a 100-unit motel originally (with space for later expansion), more campsites, playgrounds and tennis courts.

—Approval by Congress of a bill making the Buffalo a national river. The last 7 miles of this 132-mile clear, free-flowing stream form part of the western border of the Sylamore Ranger District. Like the caverns and Folk Cultural Center, the new Buffalo National River is expected to make a significant economic difference to the Ozarks. Acquisition of some 92,000 acres of land along the Buffalo began this year after river headquarters were established at Harrison. Within this strip of land is planned development of a visitor center, campgrounds, picnic areas, roads and boat access points for public use of the river.

# WORK PROGRAM 1973

**OBJECTIVE:** To open Blanchard Springs Caverns to the public in July 1973.

**PRIORITY:** Since all jobs desirable for a July 1973 opening cannot be accomplished, jobs will be completed on a priority basis within funds available.

The two broad areas that will receive priority are:

1. Completion of the Visitor Information Center and the Dripstone Trail, the first tour
2. Completion of facilities in the Shelter Cave Recreation Area

<b>FUNDS AVAILABLE:</b>	Recreation Construction	\$ 895,000
	Protection and Maintenance,	87,000
	Visitor Information Services	
	Forest Roads and Trails	176,000
	Recreation Construction Carryover	4,000
	Forest Roads and Trails Sign Money	3,000
	Recreation Operation and Maintenance	<u>15,000</u>
	<b>TOTAL</b>	<b>\$1,180,000</b>

## LISTING OF FY 1973 JOBS:

1. Finish Construction of Visitor Information Center
  - a. Change orders
  - b. Professional Inspection services
  - c. Installation of fire suppression equipment
2. Signs
  - a. Develop entrance road interpretive plan
  - b. Develop Caverns Complex sign plan
  - c. Purchase and install complex signs
  - d. Develop geographic regional sign plan with State of Arkansas
3. Complete Dripstone Trail
  - a. Complete final (interpretive) lighting
  - b. Install handrails



- c. Install emergency toilet in service entrance
  - d. Install communications system
  - e. Purchase and install first aid equipment
  - f. Purchase or rent portable steam generator for plant growth removal from cave formations
  - g. Carpet lower elevator lobby
  - h. Provide trash containers at rest areas
  - i. Complete general clean up of area
  - j. Seal air lock doors
  - k. Activate elevators
  - l. Pave tunnel from Coral Room to Cathedral Room
  - m. Install water system for future cleaning and maintenance
4. Complete Water Drainage of Visitor Information Center Parking Lot
5. Staff Salaries, Moving and Training Costs (beginning January 1973 and ending June 30, 1973)
6. Operation and Maintenance Costs
- a. Electrical (new service)
  - b. Uniforms for guides and other new employees
  - c. Janitorial supplies
  - d. Road and trail maintenance
  - e. Sewage treatment maintenance
  - f. Sewage contract
  - g. Visitor Information Center security and maintenance
  - h. Caverns maintenance
  - i. Water system maintenance
  - j. Vehicle maintenance
7. Exhibits and Audio Visual Program
- a. Design, construct and install exhibits
  - b. Produce audio visual program
8. Printed Brochures
- a. Recreation map of the Sylamore District
  - b. Brochure on the caverns
9. Equipment Purchase
- a. Vehicles
  - b. Radios
  - c. Cave trail cleaning equipment
  - d. Vacuum for parking lot and outside trails

- e. Office equipment and supplies for Visitor Information Center
- f. Furnishings for new ranger office
- g. Additional environmental monitoring equipment
- h. Stud gun for cave construction

10. Furnish the Visitor Information Center

11. Complete Shelter Cave Recreation Area

- a. Complete construction of amphitheater
- b. Purchase and install audio visual equipment for amphitheater
- c. Construct toilets and orientation shelter
- d. Construct 1.5 miles of concrete walks
- e. Remove old road
- f. Remove overlook
- g. Complete beach area
- h. Complete construction of roads, bridges and parking areas
- i. Install 27 picnic units
- j. Complete lighting for trail and parking areas
- k. Complete installation of water and sewage system
- l. Install 6 Jet-O-Matics (to replace existing pit toilets) at North Sylamore Campground
- m. Design and order displays for orientation shelter
- n. Construct and install bulletin boards
- o. Install safety fence above Shelter Cave
- p. Complete wing wall construction at Blanchard Springs

12. Prepare for Dedication and Opening

13. Install Emergency Pump for Water System

14. Investigate and Proceed with Summer Staff Housing

15. Construct New Entrance Road to the Caverns Complex

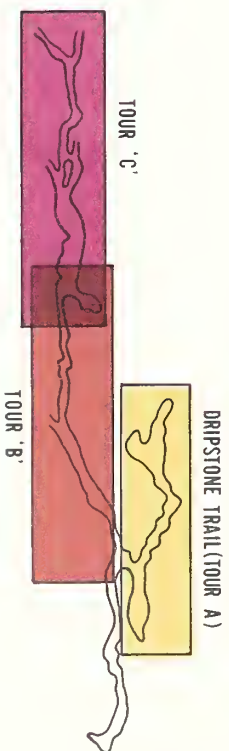
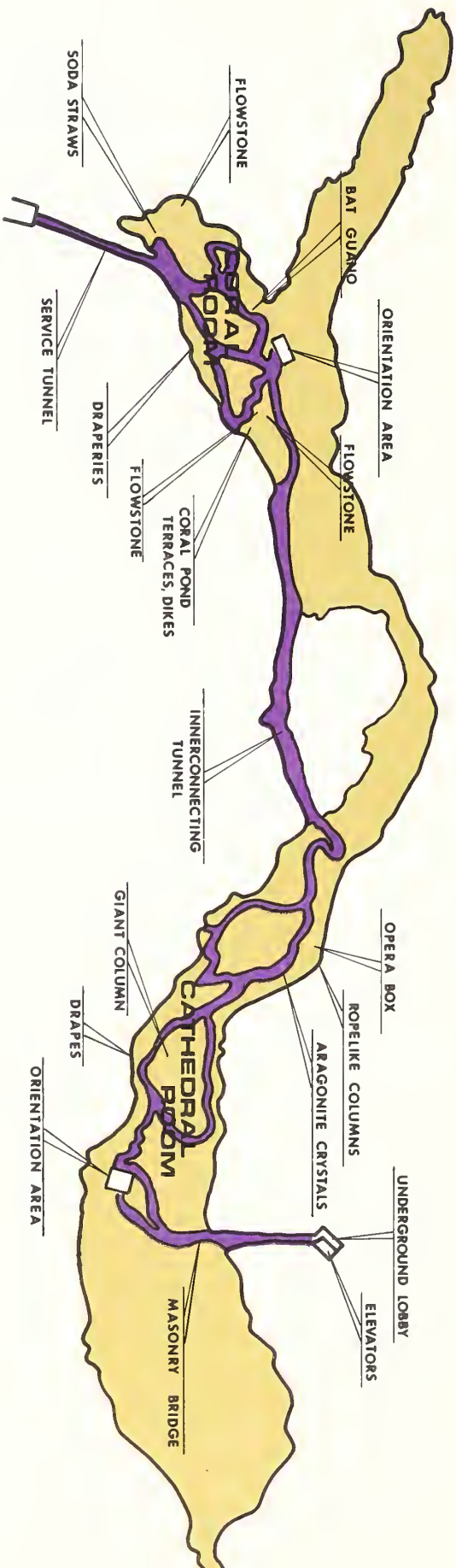
16. Construct Walks from Visitor Information Center to Parking Lot

17. In-Service and Out-Service Consulting and Minor Contracts

18. Design Campground

19. Start Interpretive Plan for Tour B in the Caverns

# Dripstone Trail





# *Future Progress:*

## *PHASE 2*

Phase 2 of the Blanchard Springs Caverns Project is vital to meet the public demand of more than half a million visitors annually and 5,700 daily (on peak weekend days) arriving at the Caverns Complex by 1975.

For the visitor to derive maximum benefit from a trip to the caverns, development of two other tours is essential to the overall project and should be completed as soon as financially feasible after opening in July 1973.

The Dripstone Trail will accommodate 950 daily visitors on the 3,840 feet of trail in the upper level of the caverns system. With all three tours in operation, a maximum of 4,550 visitors would be able to tour almost 3½ miles of the caverns during the course of some 5 hours. They will view a flowstone believed to be the largest ever discovered in a cave, and the lower passage will afford visitors a look at the underground stream.

Development of these two tours will get under way in earnest during Phase 2 beginning in FY 1974. The Ozark National Forest estimates that completion of this important phase will cost \$6.56 million—\$4.62 million in funds appropriated for construction and land acquisition, and \$1.94 million to be allocated for forest roads and trails.

With this \$6.56 million, tours B and C would become reality. The funds would also be used to design and implement a transit system to carry visitors to and from a new cave entrance and exit. Other jobs that would be accomplished in Phase 2 include landscaping the Visitor Information Center parking lot, expanding the sewage system, designing and constructing campgrounds, reconstructing a major Forest Service road on the complex, increasing interpretive services at the Shelter Cave Recreation Area, constructing trails and beach areas, purchasing equipment and continuing the planning effort.

Cost estimates for this phase can, of course, vary greatly. Over the years, construction costs on the project have increased significantly. Generally, costs incurred will run higher than normal because of the caverns' remote location, the lack of necessary labor skills in the area, the difficult construction operations required for underground development, and other unforeseen factors. The estimates are based on 1972 dollar value and with incomplete plans. They also reflect Forest Service knowledge of previous costs incurred on the project and previous standards of quality, taking into account anticipated increases due to stepped up economic activity in the area.

The forest can use efficiently these funds for Phase 2:

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	CONSTRUCTION AND LAND ACQUISITION	FOREST ROADS AND TRAILS	TOTAL
Phase 2 (starting FY 74)	\$4,625,000 *	\$1,940,000 *	\$6,565,000 *

	CONSTRUCTION AND LAND ACQUISITION	FOREST ROADS AND TRAILS	TOTAL FOR FY
FY 74	\$1,445,000*	\$ 110,000	\$1,555,000
FY 75	1,750,000	1,520,000	3,270,000
Future Fiscal Years	<u>1,430,000</u>	<u>310,000</u>	<u>1,740,000</u>
	\$4,625,000	\$1,940,000	\$6,565,000

\*Does not include \$982,000 for Operation and Maintenance

#### FY 74

FY 74 WORK PROGRAM: \$1,445,000 C&LA and \$110,000 FR&T

1. Construct new entrance and exit for Tours B and C
2. Landscape Visitor Information Center parking lot
3. Expand District Work Center
4. Initiate construction on Tour B
5. Design campground
6. Construct additional interpretive facilities at Shelter Cave Recreation Area
7. Construct trail from Visitor Information Center to Blanchard Springs
8. Construct 3.5 miles of hiking trail along North Sylamore Creek
9. Expand sewage system (40,000 gallons)
10. Add tertiary treatment to sewage plant (2 units)
11. Planning and design for construction projects

#### FY 75

FY 75 WORK PROGRAM: \$1,750,000 C&LA and \$1,520,000 FR&T

1. Finish construction on Tour B
2. Develop interpretive plan for Tour C

3. Design transit system for Tours B and C
4. Develop beach and change enclosure at Sylamore campground
5. Reconstruct Green Road, Forest Service Road #1113
6. Construct campground
7. Construct additional interpretive facilities at Shelter Cave Recreation Area
8. Planning and design for construction projects

#### **FUTURE FISCAL YEARS**

\$1,430,000 C&LA and \$310,000 FR&T

1. Construct transit system for Tours B and C
2. Construct Tour C
3. Expand Barkshed campground





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